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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/737,139
Filing Date: December 15, 2003
Appellant(s): HASWELL, JONATHAN

Joseph P. Curtin
Reg. No. 34,571
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 20 August 2008 appealing from the Office action mailed 06 May 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,098,128	VELEZ-MCCASKEY	8-2000
6,636,878	RUDOFF	10-2003
5,677,900	NISHIDA	10-1997
7,085,819	BRIGHT	8-2006

6,223,300	GOTOH	4-2001
5,960,169	STYCZINSKI	9-1999
6,742,137	FREY	5-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3, 5, 6, 9, 10, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, and further in view of Nishida, U.S. Patent No. 5,677,900.

Referring to claim 1, Velez-McCaskey discloses a storage management system that automatically selects an appropriate RAID level for storage of files based on block size (Col. 10, lines 6-19), which meets the limitation of a policy manager comprising at least one rule relating to block-level storage for a RAID level of protection for a file stored on the plurality of storage units, the RAID level of protection being selected from a plurality of RAID levels of protection. The storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of at least one rule being based on an access pattern of files stored on the plurality of storage units, an access manager providing the policy manager with information relating to access patterns of files stored on the plurality of storage units. Velez-McCaskey does not disclose that the storage system stores information about each data block that indicates the number of files that require the data block for rebuilding. Rudoff discloses a storage system wherein when multiple files contain the same data block, only one copy of the shared data block is stored along with a reference value that indicates the number of files that are associated with the data block (Abstract & Col. 3,

lines 55-60), which meets the limitation of the filing system comprising information for each data block of the file indicating a number of files in the filing system that require the data block for rebuilding another file. It would have been obvious to one of ordinary skill in the at the time the invention was made to share data blocks in the storage management system of Velez-McCaskey, in the manner discussed in Rudoff, in order to minimize the storage space required when files contain the same data blocks as taught by Rudoff (Col. 3, lines 35-37). Rudoff does not disclose that the shared data blocks include parity information. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the shared data blocks to include parity information in order to provide error detection and correction when the data files are rebuild as taught by Nishida (Col. 1, lines 29-33).

Referring to claims 2, 3, Velez-McCaskey discloses that the RAID level for storage of each file is based on the file size (Col. 10, lines 14-15), which meets the limitation of the selected RAID level of protection is selected further based on size of the file, and on contents of the file.

Referring to claims 5, 6, Velez-McCaskey discloses that large files might be assigned to RAID-3, while small files would be assigned to RAID-5 (Col. 10, lines 15-18), which meets the limitation of at least two files are stored on the plurality of storage units having different RAID levels of protection, at least two files stored on a same storage unit have different RAID levels of protection.

Referring to claim 9, Velez-McCaskey discloses a storage management system that automatically selects an appropriate RAID level for storage of files based on block size (Col. 10, lines 6-19), which meets the limitation of a RAID manager responsive to a rule contained in the policy manager by implementing the selected RAID level of protection for a file.

Referring to claim 10, Velez-McCaskey discloses the storage management system isolates regular backups from user intervention, thereby addressing problems associated with forgetful or recalcitrant employees who fail to execute backups regularly (Col. 2, lines 50-53), which meets the limitation of a RAID engine responding to the RAID manager by generating RAID redundancy type information for the file.

Referring to claim 12, Velez-McCaskey discloses that the storage devices could be hard drives (Col. 11, lines 41-42).

Referring to claim 13, Velez-McCaskey discloses that the storage devices could be SRAM (Col. 10, lines 51-57), which meets the limitation of at least one storage unit comprises a random access memory device.

Referring to claim 14, Velez-McCaskey discloses that the storage devices could be a CD-ROM drive (Col. 11, lines 41-42), which meets the limitation of at least one storage unit comprises an optical drive.

Claims 4, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900 as applied to claim 1 above, and further in view of Bright, U.S. Patent No. 7,085,819. Referring to claim 4, Velez-McCaskey discloses that the RAID level for storage of each file is based on the file size (Col. 10, lines 14-15), but does not mention file name or location. Bright discloses that the RAID level is determined based on file name and directory information (Col. 14, lines 45-67), which meets the limitation of the selected RAID level of protection is selected further based on the name of the file and a location of the file in a name space of the filing system. It would have been obvious to one of ordinary skill in the art at

the time the invention was made to determine the RAID level in the storage management system of Velez-McCaskey based on the file name and directory information in order to determine the RAID level based on how critical the data is as taught by Bright (Col. 15, lines 18-23).

Referring to claim 11, Velez-McCaskey does not mention storage capacity. Bright discloses that storage is selected based on capacity (Col. 14, lines 45-53), which meets the limitation of a space manager containing availability information for each storage block on the plurality of storage units. It would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain capacity information about the storage units in Velez-McCaskey so that storage can be determined based on the amount of storage space is available for each storage unit as taught by Bright (Col. 14, lines 45-53).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900 as applied to claim 1 above, and further in view of Gotoh, U.S. Patent No. 6,223,300.

Referring to claim 7, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), but does not mention determining the stripe size based on the file accesses. Gotoh discloses a disc array apparatus wherein the stripe size is determined based on file access information (Col. 5, lines 31-36), which meets the limitation of the information relating to access patterns of files is used for determining at least one RAID stripe size. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary

the stripe size, in Velez-McCaskey, based on the file access information, as described in Gotoh, in order to optimize the parameters set for access to the configured disks as taught in Gotoh (Col. 1, lines 43-54).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, and further in view of Styczinski, U.S. Patent No. 5,960,169. Referring to claim 8, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of the information relating to access patterns of files is used for write coalescing data for storage on the plurality of storage units, but does not does not disclose that this is done between RAID stripes. Styczinski discloses relocating data in one stripe to a partially filled stripe (Col. 15, lines 11-20), which meets the limitation of the filing system coalesces data in a partially full RAID stripe with data from another RAID stripe to make unused space available . It would have been obvious to one of ordinary skill in the art at the time the invention was made for the data of Velez-McCaskey to be relocated to a partially filled stripe in order to provide sufficient storage space as taught by Styczinski (Col. 15, lines 11-20).

Claims 15-20, 24-26, 28-33, 35, 36, 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent

No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, further in view of Frey, U.S. Patent No. 6,742,137.

Referring to claims 15, 26, 31, Velez-McCaskey discloses a storage management system wherein users can create and edit stored files within the storage systems (Col. 11, lines 38-41), which meets the limitation of receiving a request at a filing system to create a file on the plurality of storage units, determining at a filing system that a file stored on the plurality of storage units should be updated. The storage management system automatically selects an appropriate RAID level for storage of files based on block size (Col. 10, lines 6-19), which meets the limitation of querying a policy manager for at least one rule relating to block-level storage for a RAID level of protection for the file created on the plurality of storage units, the RAID level of protection being selected from a plurality of RAID levels of protection, writing the file to the plurality of storage units based on the RAID level of protection selected for the file. The storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of at least one rule contained within the policy manager being based on an access pattern of files stored on the plurality of storage units. Velez-McCaskey does not disclose maintaining the RAID information in metadata. Frey discloses a fault tolerance system wherein metadata for each objects is maintained as a part of the object index (Col. 4, lines 6-7). The metadata describes storage locations for portions of the data object and includes fault tolerance information regarding a RAID level and storage information for the fault tolerance information (Col. 4, lines 8-21), which meets the limitation of maintaining metadata relating to a location of RAID information for the file within the filing system metadata information. It would have been obvious to one of ordinary skill in the art at the time the

invention was made to store the RAID information in metadata in order to provide a fault tolerance technique that is flexible and allows for different fault tolerant techniques to be applied to different data objects on a single storage volume as taught by Frey (Col. 2, lines 47-58). Velez-McCaskey does not disclose that the storage system stores information about each data block that indicates the number of files that require the data block for rebuilding. Rudoff discloses a storage system wherein when multiple files contain the same data block, only one copy of the shared data block is stored along with a reference value that indicates the number of files that are associated with the data block (Abstract & Col. 3, lines 55-60), which meets the limitation of the filing system comprising information for each data block of the file indicating a number of files in the filing system that require the data block for rebuilding another file. It would have been obvious to one of ordinary skill in the at the time the invention was made to share data blocks in the storage management system of Velez-McCaskey, in the manner discussed in Rudoff, in order to minimize the storage space required when files contain the same data blocks as taught by Rudoff (Col. 3, lines 35-37). Rudoff does not disclose that the shared data blocks include parity information. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the shared data blocks to include parity information in order to provide error detection and correction when the data files are rebuild as taught by Nishida (Col. 1, lines 29-33).

Referring to claim 16, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of providing the policy manager with information relating to access patterns of files stored on the plurality of storage units.

Referring to claims 17, 18, 35, 36, Velez-McCaskey discloses that the RAID level for storage of each file is based on the file size (Col. 10, lines 14-15), which meets the limitation of the selected RAID level of protection is selected further based on size of the file, and on contents of the file.

Referring to claims 19, 20, Velez-McCaskey discloses that large files might be assigned to RAID-3, while small files would be assigned to RAID-5 (Col. 10, lines 15-18), which meets the limitation of at least two files are stored on the plurality of storage units having different RAID levels of protection, at least two files stored on a same storage unit have different RAID levels of protection.

Referring to claim 24, Velez-McCaskey discloses a storage management system that automatically selects an appropriate RAID level for storage of files based on block size (Col. 10, lines 6-19), which meets the limitation of implementing the selected RAID level of protection for a file based on a rule contained in the policy manager.

Referring to claim 25, Velez-McCaskey discloses the storage management system isolates regular backups from user intervention, thereby addressing problems associated with forgetful or recalcitrant employees who fail to execute backups regularly (Col. 2, lines 50-53), which meets the limitation of generating RAID redundancy type information for the file.

Referring to claims 28, 38, Velez-McCaskey discloses that the storage devices could be hard drives (Col. 11, lines 41-42).

Referring to claims 29, 39, Velez-McCaskey discloses that the storage devices could be SRAM (Col. 10, lines 51-57), which meets the limitation of at least one storage unit comprise a random access memory device.

Referring to claims 30, 40, Velez-McCaskey discloses that the storage devices could be a CD-ROM drive (Col. 11, lines 41-42), which meets the limitation of at least one storage unit comprise an optical drive.

Referring to claim 32, Velez-McCaskey discloses a storage management system wherein users can create and edit stored files within the storage systems (Col. 11, lines 38-41), which meets the limitation of writing the file writes the file at the same place on the plurality of storage units that the file was located before the writing based on the selected RAID level of protection because no relocation is described as being involved with the editing process.

Referring to claim 33, Velez-McCaskey discloses that files can be relocated within the system (Col. 11, lines 42-51), which meets the limitation of writing the files writes the file at a different location on the plurality of storage units based on the selected RAID level of protection.

Claims 22, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, in view of Frey, U.S. Patent No. 6,742,137, and further in view of Styczinski, U.S. Patent No. 5,960,169.

Referring to claims 22, 34, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of the information relating to access patterns of files is used for write coalescing data for storage on the plurality of storage units, but does not does not disclose that this is done between RAID stripes. Styczinski discloses relocating data in one stripe to a partially filled stripe (Col. 15, lines 11-20), which meets the limitation of

the filing system coalesces data in a partially full RAID stripe with data from another RAID stripe to make unused space available . It would have been obvious to one of ordinary skill in the art at the time the invention was made for the data of Velez-McCaskey to be relocated to a partially filled stripe in order to provide sufficient storage space as taught by Styczinski (Col. 15, lines 11-20).

Claims 21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, further in view of Frey, U.S. Patent No. 6,742,137 as applied to claim 15 above, and further in view of Gotoh, U.S. Patent No. 6,223,300.

Referring to claims 21, 23, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), but does not mention determining the stripe size based on the file accesses. Gotoh discloses a disc array apparatus wherein the stripe size is determined based on file access information (Col. 5, lines 31-36), which meets the limitation of the information relating to access patterns of files is used for determining at least one RAID stripe size. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the stripe size, in Velez-McCaskey, based on the file access information, as described in Gotoh, in order to optimize the parameters set for access to the configured disks as taught in Gotoh (Col. 1, lines 43-54).

Claims 27, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of

Nishida, U.S. Patent No. 5,677,900, further in view of Frey, U.S. Patent No. 6,742,137 as applied to claims 15, 31 above, and further in view of Bright, U.S. Patent No. 7,085,819.

Referring to claim 27, Velez-McCaskey does not mention storage capacity. Bright discloses that storage is selected based on capacity (Col. 14, lines 45-53), which meets the limitation of a space manager containing availability information for each storage block on the plurality of storage units. It would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain capacity information about the storage units in Velez-McCaskey so that storage can be determined based on the amount of storage space is available for each storage unit as taught by Bright (Col. 14, lines 45-53).

Referring to claim 37, Velez-McCaskey discloses that the RAID level for storage of each file is based on the file size (Col. 10, lines 14-15), but does not mention file name or location. Bright discloses that the RAID level is determined based on file name and directory information (Col. 14, lines 45-67), which meets the limitation of the selected RAID level of protection is selected further based on the name of the file and a location of the file in a name space of the filing system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the RAID level in the storage management system of Velez-McCaskey based on the file name and directory information in order to determine the RAID level based on how critical the data is as taught by Bright (Col. 15, lines 18-23).

(10) Response to Argument

Appellant argues, "combining Nishida with Velez-McCaskey, on one hand, would change the principle of operation of Nishida…" This argument is not persuasive because Nishida is not being modified. As stated by Appellant, "if the proposed modification or combination of

the prior art would change the principle operation of the prior art invention ***being modified***, then the teachings of the references are not sufficient to render the claims *prima facie* obvious."

Appellant argues, "to modify Velez-McCaskey as taught by Nishida as urged by the Examiner would result in there not being one surface 66 of each of the drives of Velez-McCaskey that would be dedicated to parity because the parity would be recorded sequentially with the data on the drives (as taught by Nishida)." Appellant is apparently alleging that the proposed modification would change the principle operation of Velez-McCaskey. However, providing parity information in the data blocks of a file, as taught by Nishida, as opposed to a surface of a drive does not change the principle operation of Velez-McCaskey. Additionally, Appellant has failed to explain or provide evidence of how the principle operation of Velez-McCaskey would be changed by the proposed modification.

Appellant argues, "the proffered reasoning is nothing more than a conclusory statement without any support." This argument is not persuasive because the Examiner pointed directly to a citation of Nishida to provide support for the proposed modification. Additionally, in discussing the obviousness of claimed combinations of elements of prior art,

KSR Int'l v. Teleflex, Inc., 127 S. Ct. 1727, 1739-40, 82 USPQ2d 1385, 1395 (2007) explains:

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* [*v. AG Pro, Inc.,* 425 U.S. 273, 189 USPQ 449 (1976)] and *Anderson's-Black Rock*[*, Inc. v. Pavement Salvage Co.,* 396 U.S. 57, 163 USPQ 673 (1969)] are illustrative - a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

Appellant's arguments are unconvincing because they fail to take into account that a reference may be understood by the artisan as suggesting a solution to a problem that the reference does not discuss. *Id.*, 127 S. Ct. at 1742, 82 USPQ2d at 1397 ("Common sense teaches...that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle…A personal of ordinary skill in also a person of ordinary creativity, not an automaton.").

The remainder of the arguments made by the Appellant (page 9 section C through page 18) essentially mirror the arguments addressed above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Primary Examiner, Art Unit 2432

Conferees:

/Christopher A. Revak/
Primary Examiner, Art Unit 2431

/Gilberto Barron Jr/
Supervisory Patent Examiner, Art Unit 2432